The Journal OF THE South Carolina Medical Association

VOL. XVI. GREENVILLE, S. C., JUNE, 1920 NO. 6

DR. K. M. LYNCH

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Colonial Lake **Charleston, S. C.**

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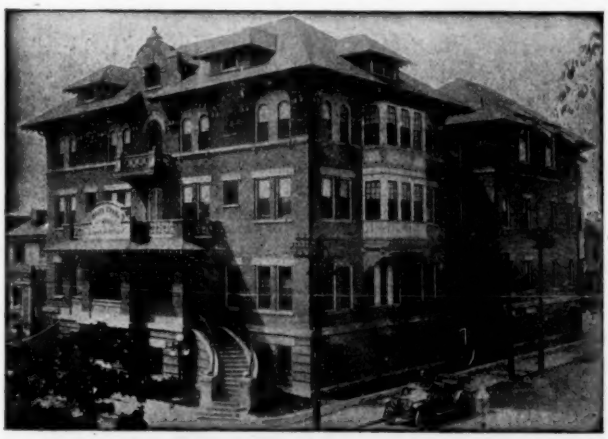

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The Journal OF THE South Carolina Medical Association

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EYE, EAR, NOSE, AND THROAT.
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EDITORIAL

A. M. A. NOTES.

The meeting of the American Medical Association, held at New Orleans the last week in April, was largely attended by South Carolina physicians. We noted about forty, which is a greater number than probably has ever attended the meeting before. The profession and citizens of New Orleans were unsparing in their efforts to make the stay of the physicians and their wives pleasant. Barring some shortage of hotel accommodations ,their efforts were eminently successful. Few cities in America have hotel accomodations for the American Medical Association without crowding. The House of Delegates went on record as strongly favoring more drastic measures in behalf of taking care of the narcotic drug addicts; the ambulatory treatment was strongly condemned and proper institutional care urged. The Constitution and By-Laws of the Associations were completely revised and simplified. The various scientific sections were well up to the standard in their programs. Dr. Hubert Work, of Colorado, was elected President, and Boston, Massachusetts, elected as the place of meeting for 1921.

ANNUAL DUES TO BE INCREASED 1921

At the recent meeting of the State Medical Association, the House of Delegates amended the by-laws, increasing the dues of members from three to five dollars annually. This step was necessary owing to the marked increase in the cost of publishing the Journal, and other expenses of the Association; and is in line with similar action taken by the majority of the State Associations of the country. This increase will not go into effect until January 1, 1921.

MINUTES

House of Delegates, Seventy-Second Annual Meeting, Held in Greenville, S. C., April 20, 21, 1920. The President, Dr. E. W. Pressley, of Greenville, in the Chair.

The House of Delegates was called to order by the President at 10.15 A. M.

Appointment of Committee on Credentials.

The President appointed on this Committee, Dr. C. R. May of Florence, Dr. J. S. Stribling of Oconee, and Dr. Dulin of York.

Report of Committee on Credentials.—Dr. May presented this report.

In the absence of the delegate from Darlington, Dr. Edwards was appointed to represent Darlington.

Dr. M. J. Walker:—Six years ago we made a ruling that when a man was not present who was the regular delegate another man from his county could serve.

President:—Dr. Edwards is enrolled from Darlington.

Dr. M. J. Walker:—We also passed a motion at that time that when a delegate was once seated, even if the regular delegate came, the one that was appointed should continue to act.

President:—This was agreed upon and understood.

President's Report:—Dr. Pressley:—It is my pleasure to report that during this last year since our meeting in Florence in 1919 the Society has made steady progress. It has gotten over the jolt of the war, and already the County Societies have gotten under way, though all the Districts have not done so.

I want to congratulate the Committee on Public Policy and Legislation. When that Committee was appointed it was known what a proposition it was up against. It is easy to fight when everything is coming your way but it is a different thing when everything is going against you. "It is easy to laugh when life goes like a song.

"But the man worth while is the man who can smile when everything goes dead wrong."

They had to fight apparently a losing game and they had to snatch victory from the jaws of defeat. They have succeeded in giving us a Medical Practice Act of which we need not be ashamed for many years to come.

We can be congratulated also that South Carolina has obtained a decent appropriation for the Medical College of South Carolina. There are just two ways to kill a thing, the one is to starve it to death and the other is to knock it in the head. Fortunately neither of these has been resorted to. The appropriation of the Legislature this year will insure such building and equip-

ment as to assure us that it will do much better work in the future than it has done in the past.

REPORT OF THE SECRETARY-TREASURER. FISCAL YEAR 1919.

(Dr. E. A. Hines, Seneca, S. C.)

During the year 1919, there was evidence of marked increase in interest in many of the county societies. It was noted that men returning from the various services of the government, as a rule, immediately took steps to get in touch with their county societies. The membership showed a slight falling off from the previous year; this was to be expected owing to disturbed conditions generally. Some of the larger societies showed an increase in membership, especially those counties in which there are good sized cities and towns. Much of the increased interest may be attributed to the enthusiasm and leadership of our President, who made many visits to different parts of the state during the year, delivering inspiring addresses to the members. It may be of interest to note that we had 39 counties with members enrolled. The number of members in each one of these counties, as follows:

Abbeville	7
Allendale	3
Anderson	20
Aiken	7
Bamberg	11
Barnwell	12
Beaufort	(no report)
Calhoun	(no report)
Charleston	73
Cherokee	1
Chester	18
Chesterfield	7
Clarendon	14
Colleton	1
Darlington	21
Dillon	8
Dorchester	(no report)
Edgefield	8
Florence	28
Georgetown	4
Greenville	45
Greenwood	19
Hampton	2
Horry	10
Kershaw	11
Lancaster	3
Laurens	21
Lee	9
Lexington	8
Marion	14
Marlboro	13
Newberry	8
Orangeburg	13
Pickens	18
Richland (Columbia)	79
Saluda	11
Spartanburg	50
Sumter	25
Union	15
Williamsburg	1
York	24
	657
Honorary Members	7
Total	664

The secretary was able to visit quite a number of district and county societies and found, as a rule, well attended meetings and a good program. This leads to the observation that much is desired along the line of definite programs for many of the smaller county societies. We urged some years ago, that each couny society map out a program for a year in advance. We note that recently Spartanburg has done this; perhaps, there are some other counties. We would urge this suggestion for the coming year.

The officers at the beginning of the war, had under consideration post-graduate courses for the county socie-

ties, but the on-coming conflict interferred with the consumation of our plans. We have now taken steps to put on these post-graduate courses. We have secured the co-operation of the Medical College of the State of South Carolina; the University of South Carolina; the State Board of Health, and now await only the approval of the House of Delegates to put these post-graduate courses on. They have been highly successful in certain states of the middle West the past year. We believe that if properly presented, these courses will go far towards supplying information to the physicians, especially in the more sparsely settled communities and which will keep them in closer touch with modern progress, and with the various activities of the State Medical Association. We recommend that a standing committee on post-graduate instruction be appointed, whose duty it shall be to co-operate with the Council and the Secretary in this matter. On the whole, the Association gives evidence of increase in membership and greater interest in all of its activities for the coming year.

As will be noted by the subject matter of various reports made to this body, and the discussions on the same, there are two problems especially pressing for solution in the next few years. One is the question of hospital standardization, and the other, further development of public health work. It would appear that our Association should be in the fore-front in whatever development may occur. In order that this may be the case, I would recommend that the Association take the initiative in forming a South Carolina Hospital Association by appointing a chairman and secretary to bring together by a suitable program at our next annual meeting the hospital executives of South Carolina. No more potent means of stimulating increased activity along this line could be found. The results will amply repay the effort. Again, the very liberal increases in appropriation by the legislature and by counties and municipalities means more rapid development of public health work in South Carolina. To this end, a South Carolina Health Offires' Association would contribute much. The various interests involved may well be brought together at the time of our annual meeting and more comprehensive plans evolved than would otherwise e the case.. The House of Delegates may appoint a Chairman and a Secretary to devise ways and means of bringing this about. Had this plan not been tried out and proven to be feasible, I should hesitate to make these suggestions. My only purpose is to greatly enlarge the usefulness of the South Carolina Medical Association in all that pertains to the progress of medicine and surgery and Public Health. In conclusion of this part of the secretaries report, I wish to call attention to a copy of a letter recently sent to all the contributors to the scientific program, except our invited guests, and to recommend that section one, chapter ten, of the By-laws be amended to read:

CHAPTER X.

Section 1. No address or paper before the Association, except those of the President and orators, shall occupy more than fifteen minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject, except by unanimous consent.

Report of Dr. E. A. Hines, Treasurer of the South Carolina Medical Asso-

ciation for year ending December 31st, 1919:

Seneca, S. C., April 17, 1920.

Dr. E. A. Hines, Secretary-Treasurer, South Carolina Medical Association, Seneca, South Carolina.

Dear Sir:

In accordance with your instructions I have audited the books and accounts of the South Carolina Medical Association and attach hereto statement, made in the form of your Annual Report to the Association, which exhibits the Receipts and Disbursements for the year ending December 31st, 1919, also a statement of the assets of the Association, there being no liabilities.

Respectfully,
SYDNEY BRUCE,
Auditor.

Treasurer's Report South Carolina Medical Association, 1919

Balance January 1, 1919	$ 59.60
Membership dues:	
Anderson County Medical Society	$ 50.00
Aiken County Medical Society	20.00
Abbeville County Medical Society	14.00
Allendale County Medical Society	8.00
Barnwell County Medical Society	28.00
Bamberg County Medical Society	26.00
Charleston County Medical Society	152.00
Chesterfield Co. Medical Society	14.00
Colleton County Medical Society	2.00
Columbia County Medical Society	158.00
Clarendon County Medical Society	32.00
Chester County Medical Society	40.00
Darlington Co. Medical Society	42.00
Dillon County Medical Society	16.00
Edgefield County Medical Society	16.00
Florence County Medical Society	56.00
Georgetown Co. Medical Society	8.00
Greenwood Co. Medical Society	38.00
Greenville County Medical Society	90.00
Hampton County Medical Society	4.00
Horry County Medical Society	2.00
Kershaw County Medical Society	22.00
Lexington Co. Medical Society	16.00
Laurens County Medical Society	42.00
Lancaster Co. Medical Society	6.00
Lee County Medical Society	16.00
Marion County Medical Society	26.00
Marlboro County Medical Society	26.00
Newberry County Medical Society	16.00
Orangeburg Co. Medical Society	26.00
Oconee County Medical Society	30.00
Pickens County Medical Society	34.00
Saluda County Medical Society	22.00
Sumter County Medical Society	46.00
Spartanburg Co. Medical Society	100.00
Union County Medical Society	30.00
Williamsburg Co. Medical Society	2.00
York County Medical Society	48.00
	$1,342.00

December 31, 1919

Norwood Memorial Fund	157.75
Miscellaneous collections	53.50
Total	$1,594.85

Statements of Assets South Carolina Medical Association

Cash on deposit with Seneca Bank to credit of Association	$ 269.60
Office Furniture and Equipment	220.00
Fund for prosecution of illegal practitioners	145.35
Sims Memorial Fund	50.00
	$ 684.95

Disbursements.

Salaries	$ 716.90
Office Expenses	87.33
Stamps	35.00
Stenographer reporting State Meeting	148.66
Miscellaneous	189.71
Balance with Seneca Bank	417.35
	$1,594.35

Members for 1920

Aiken	8
Anderson	43
Beaufort	1
Barnwell	14
Bamberg	10
Chesterfield	10
Cherokee	8
Clarendon	9
Chester	9
Charleston	85
Columbia	85
Dorchester	20
Greenwood	30
Georgetown	5
Greenville	67
Horry	1
Kershaw	10
Lexington	10
Laurens	19
Lee	9
Marlboro	11
Marion	11

Newberry	21
Orangeburg	18
Oconee	13
Pickens	25
Sumter	22
Spartanburg	53
Union	12
York	32
	740
Anderson honorary	4
Sumter, honorary	2
	6

I hereby certify that the foregoing statement of the South Carolina Medical Association, showing receipts and disbursements, balances to credit of Special funds and statements of assets and equipment, are correct as shown by their books as at December 31st, 1919. I have verified the credit of the Special Fund and of the Association at the Seneca Bank, Seneca, S. C., and find same to agree with amount shown by books of the Association.

SYDNEY BRUCE,
Auditor.

Report of the Committees on Revision of Medical Practice Act and Public Policy Legislation:

Dr. A. Earle Boozer, Chairman.

In 1915 at the Greenwood meeting of the South Carolina Medical Association the members of the American delegation offered several amendments to our Medical Act. The discussion which followed, brought forward a motion that a committee be appointed to draft a new Act. This motion was adopted and a committee, consisting of Drs. A. Earle Boozer, Clyde F. Ross and J. S. Matthews was appointed, and after a comprehensive study of similar Acts from other States, drafted a new Medical Practice Act.

The result of the work of this committee was reported at the Charleston meeting of the Association in 1916, when a motion was made and carried to increase the committee by seven. As this number was too unwieldly for practical purposes and general unsettled war time conditions made it impossible to secure a meeting, nothing more was accomplished until January 9th, 1920, when a special meeting was called at the Jefferson Hotel, Columbia, S. C., by the President, Dr. E. W. Pressly and attended by the following members: Drs. E. W. Pressly, Baxter Haynes, L. O. Mauldin, T. L. W. Bailey, W. P. Timmerman, Miles J. Walker, C. R. May, H. L. Shaw, S. E. Harmon, W. P. Cornell, J. R. Miller, W. W. Fennell, J. H. Taylor LaBruce Ward and A. Earle Boozer. The situation was thoroughly discussed and the following was unanimously adopted:

"That the original committee on Medical Revision be empowered to employ counsel in preparing and passing a new Medical Practice Act, amending the old Act or make such other legislative changes as they may deem necessary." To the original committee was added Drs. J. H. Taylor and S. E. Harmon, and Dr. C. F. Williams was appointed in place of Dr. Clyde F. Ross, who had in the meantime, moved out of the State.

Mr. W. S. Nelson, a Columbia attorney, was employed as advisor, to check up the Act and see that it was in proper legal form.

After a unanimous favorable report from the Committee ond Medical Affairs, the Bill was read in the House of Representatives for the first time on January the 28th, 1920. It received its first blow when it was re-commited to the Committee on Medical Affairs, introduced, however, a second time and finally passed by the handsome majority

of 62 to 23, due to the untiring work and wonderful engineering ability of Dr. E. H. Barnwell, of the Charleston Delegation, who introduced the Bill, and to Dr. W. A. Preacher, of Jasper county, who ably assisted Dr. Barnwell in the work.

Its record in the Senate has become very familiar to the members of the Medical Association, as they can bear witness that the committee in Columbia kept a rapid fire report of its progress through all the vicissitudes of the attacks of its untiring opponents, Suffice it to say that to Dr. J. B. Black, Senator from Bamberg, the South Carolina Medical Association owes a debt of gratitude, as the minority report, over his signature, saved the Bill. Moreover, the stupendous work of putting over a piece of legislation after it had received a majority, which practically killed it, was due to the combined efforts of all who worked for its passage—to Senator Proctor Bonham, of Greenville, our able floor leader in the Senate—to the untiring work of the committee in Columbia and to the splendid co-operation of the doctors over the State, who upheld the committee in their work. Just what the result of this work was can be understood from the Senate vote of 23 to 12, together with the fact that after the vote was taken it was learned that the Bill had received its first reading in the Senate on Friday the 13th of February.

The Bill received its final reading on March 4th, but with two minor amendments, so that the committee still had to follow it back to the House of Representatives, then through the Engrossing Department to its final ratification, on March 6th, Saturday night 11:58 legislative time, in reality Sunday morning 7:15.

The Act was approved by Gov. Cooper and signed in the presence of the committee on March 10th, becoming effective twenty days thereafter, on March 31st, and on April 5th a copy in the 1919 Proceeding of the State Board of Medical Examiners of South Carolina, was mailed to all members of the State Medical Association.

Report of Secretary-Treasurer:

Dr. E. A. Hines, of Seneca, presented this report. During the reading he stopped to say that the Society should take some action in regard to the Sims Memorial Fund.

Dr. Hines: I move that a Committee of three be appointed to take this report, digest it and report back to the House of Delegates later on.

The motion was seconded and carried.

Report of Committee on Public Policy and Legislation.—Dr. A. E. Boozer, of Columbia, S. C., presented this report. This report of the Committee on Public Policy and Legislation is really a joint report with the Committee on Medical Practice Act. It may be considered a report of these two things.

(After reading the report.) Like all things of this character there is a little expense account attached to it. A motion was made at the meeting of the General Committee empowering us to employ an attorney. We employed W. S. Nelson and we have his bill for $100.

We also have a bill for $26 for telegrams, telephones, stamps, etc.

President: You have heard this report, what is your pleasure?

Dr. Edgerton: I move that we endorse everything this Committee has done and that this Association go on record as extending its most hearty thanks for the work this Committee has done. Dr. Boozer went to work with his coat off and his sleeves rolled up and worked for days. There was

terrific lobbying carried on against this bill. It is due to the untiring efforts of Dr. Boozer and to the others on the committee who worked with him, Dr. Williams, Dr. Mathews, Dr. Riser and Dr. Lester and to Senators Black and Bonham from Greenville.

Dr. Baxter Hayes: I second that motion. Dr. Boozer worked twenty-two hours a day for a while, and he spent a great deal of time and effort to get this bill through.

President: It used to be a maxim to whip the horse you knew would pull." The President applied that when he appointed Dr. Boozer. I wish to express my personal obligations to Dr. Boozer and to the Committee that labored with him.

Dr. Edgerton: I move the Secretary be instructed to convey to these men and to Senator Black and Senator Bonham the thanks of this Association.

This motion was seconded and carried.

A motion to pay the bill that Dr. Boozer presented was seconded and carried.

Report of State Board of Health:—Dr. Robert Wilson presented this report. Before reading it he said: This work of the State Board of Health is reported so that you may get an idea of the activities that the State Board of Health is carrying on. You will get some idea of this when I tell you that a few years ago the State Board of Health had an appropriation of $9,000 while this year we have an appropriation of $220,000, and this puts the State of South Carolina in third place in the Union in respect to its per capita appropriation. Our activities have grown and are reaching still more and more into public health work. Briefly I will familiarize you with the work of the State Laboratories. (Read Report.)

President: I will appoint a committee to consider the Secretary's report. I appoint Dr. C. B. Earle, Dr. Kenneth Lynch and Dr. Baxter Haynes.

Dr. H. H. Wyman: I would like to ask what provision you make for follow-up work and whether you have a direct follow-up system? Should not that be a part of your work?

Dr. Wilson: We have no follow-up system.

A motion to receive this report was seconded and carried.

Report of Committee on Health and Public Instruction:—Dr. J. A. Haynes, State Health Officer, of Columbia, presented this report. He said: The work of this committee has been thoroughly covered by the report of the State Board of Health. Some things done, however, have not been mentioned.

Medical School Inspection has finally passed the Legislature. It has been passed by the House two or three times and gotten to the Senate and died there. It has at last gotten by both the House and Senate. Medical School inspection, however, is not compulsory. It gives the right to the trustees of a school to have the children inspected, and to pay ten cents per child to have the inspection carried out. There is no machinery to carry out the provisions of this bill.

A second bill provides for the inspection of hotels. All hotels in South Carolina will be thoroughly inspected once or twice a year by a representative of the State Board of Health, and I believe that will result in an improvement of conveniences and in the protection of the health of the traveling public. We have provided a score card and a certificate of the grade of excellence of the hotel. This is posted in a prominent place in the hotel where a visitor can walk in and see the standing of the hotel. The card will give information as to the water supply, the

milk supply, how the food is kept, and a number of items will be listed and given special values. The complete grade will be found at the bottom of the card, 1,000 being perfect. In this way you can walk to the score card and see just what you are getting.

Public Health education has been carried out by means of lectures and pamphlets.

A third act provides for the physical examination of school teachers. The law compels all school teachers to be examined and a certificate is given by the Board of Trustees. This certificate states if the teacher is suffering from any contagious or infectious disease. This method eliminates tuberculosis, which is a menace to children who take it more readily than do adults.

These bills have all been passed.

REPORT OF THE STATE BOARD OF HEALTH

Dr. Robert Wilson, Charleston, Chairman.

It is gratifying to report that the General Assembly has appropriated $220,000 for the work of the State Board of Health this year, which raises South Carolina to the third place in per capita appropriation. The full significance of this will be appreciated when we recall that twelve years ago, in 1908, the total amount appropriated was only $9,000.

During these years the work of the Board has expanded greatly until at the present time it comprehends laboratory diagnosis for the physicians of the State, prevention of rabies and free distribution of diphtheria anti-toxin an dof typhoid and small-pox vaccine; a department of Rural Sanitation:a Bureau of Child Hygiene;a Bureau of Vital Statistics, which through efficient organization has placed South Carolina in the registration area of the United States; the conduct of tuberculosis sanatorium; malaria prevention work; the prevention of venereal disease through clinics established by the United States Public Health Service, working in co-operation with the Board of Health, of which there are eight in different parts of the State, with an average daily attendance of fifty-one. Effective county health organizations have been perfected in seven counties, as follows: Orangeburg, Calhoun, Lee, Darlington, Fairfield, Newberry and Charleston. Each organization includes a full time health officer, a nurse, a clerk and two inspectors.

A very important addition to our organization has been the Sanitary Engineer.

A brief summary of the work fhich has been accomplished in the various departments during the first three months of the present year will give you some conception of what we are doing. In the laboratory 2, 581 diagnostic examinations have been made and 4,096 Wassermanns. The department of rural sanitation, through the county health organizations has installed 123 septic tanks and 63 pits in ninety-five homes, 3,140 homes have been visited either by the director, his inspectors, nurses or social workers; 1,304 cases have been examined for hook worm infection; 2,279 vaccinations against small-pox have been made; 1,230 cases of disease have been investigated; 3,616 school pupils have been inspected in seventy-nine schools. The department of child hygiene made demonstrations in nine counties last year, the program including pre-natal work, infant welfare, mid-wife supervision, school inspection, and, and preventive work. Seven of these nine counties are continuing the work with county appropriations. Fifteen counties now employ nurses. Four hun-

dred mid-wives have been registered and are now under supervision. Eight well-baby clinics have been established seven for whites and one for colored; the white clinics being in Greenville, Camperdown Mills, Inman Mills, Enoree Mills, Chester, Dillon and Clarendon. The colored clinic is in Greenville. This is an excellent showing and illustrates the splendid work which is being done through the agency of this bureau.

The venereal clinics are all under State control. Up to March there were 309 cases of gonorrhoea, 286 cases of syphilis and 63 cases of chancroid treated in the eight clinics. 560 cases of gonorrhoea, 495 cases of syphilis and 86 cases of chancroid were reported. 1,540 doses of arsphenamine were administered. Twenty-nine lectures and addresses were given, with an average attendance of forty-five.

The Sanitary Engineer reports that in Dillon county where intensive work was done, two sanitary privies were placed in every white school in the county, the work having been begun in September and completed in February. Two additional privies were placed at teachers' homes. The entire project involved an expenditure of about $7,500 and over 2,200 children and teachers were directly affected and their parents shown a most important object lesson. In addition to the completion of this work he has rendered important assistance in the malarial control operation at Bamberg. This work certainly demonstrates the wisdom of providing for a sanitary engineer and we trust that we shall be able to push this work until the entire State is covered.

The State Tuberculosis Sanatorium is continuing to render splendid service to the people. It is gratifying to report that the work of the Negro sanatorium is progressing satisfactorily, and that the leading Negroes throughou the State are showing great interest in the work and have declared their readiness to support the insitution in every way.

ORIGINAL ARTICLES

A METHOD OF INDUCING THE RAPID GROWTH OF EPITHELIUM OVER AREAS DENUDED OF SKIN BY THE USE OF ZINC OXIDE ADHESIVE PLASTER APPLIED DIRECTLY TO THE RAW AREA.

By Lindsay Peters, M. D., Columbia, S. C.

Read before the South Carolina Medical Association, Greenville, S. C., April 20-21, 1920.

DURING my service in the army I observed a case of varicose ulcer of the leg which was being treated by a ward surgeon, Dr. J. R. McKirsham, of El Reno, Okla., who writes me that he has used the method for a number of years, but cannot recall from whom he got the suggestion, by completely covering the ulcer with adhesive plaster and changing the plaster daily. The ulcer was about 6cm. in diameter and had indurated edges. The day following the first application of the plaster the edges of the ulcer were softened and a white circle of skin about 2 mm. in diameter began to grow in from the periphery of the raw area. At each daily dressing when the plaster was easily lifted off and the ulcer cleansed by gently sponging away the secretions, the growth of epithelium was seen to be going on at a surprisingly rapid rate and healing was complete within ten days. For many years I had used narrow strips of plaster placed radially over the ulcer like the spokes of a wheel, but had never seen the ulcer entirely covered with a solid sheet of plaster without regard to drainage. This prompt and satisfactory result in an indolent ulcer of long standing impressed itself upon my memory.

Subseqently I had under my care numerous wounds with areas of various sizes denuded of skin in which the healing was slow and unsatisfactory while being dressed in the usual way with gauze dressing, used either dry, moistered with alcohol, with hot, weak, antiseptic solutions, or with ointment of various kinds. Recalling the rapid proliferation of skin in the case of leg ulcer above referred to I decided to try the effect of using adhesive plaster applied directly to the wound as was done in the case of the ulcer and the results were so striking that I think the method worthy of your consideration.

In cases where there were clean, healthy granulations the invariable result was rapid growth of epithelium and hastened healing. In some cases the rapidity of growth of epithelium was most astonishing and far surpassed that observed in the use of any other dressing, scarlet red ointment not being excepted. As instances of unusually rapid healing I wish to cite the following cases (related from memory, as my notes of the cases were lost:).

A soldier on duty as kitchen police had a pot of boiling hot coffee spilled on his right leg. On admission to the ward the anterior and outer surfaces of the lower third of the leg, the outer surface of the ankle and an area on the outer surface of the foot were covered with very large serous blebs. On trimming away with scissors the skin of these blebs the burn was found to be of the third degree. Dur-

ing the first ten days dressings were vaselined gauze, gauze moistened with boric acid solution and ambrine. By this time healthy granulations covered the burned areas, but there was little sign of healing. The entire area was then covered over with zinc oxide adhesive plaster, which was removed and renewed daily. After about three dressings in this manner the areas on the foot and ankle (no less than 6 cm. square) were entirely covered by epithelium and there was a margin of new-formed skin about 5 cm. wide around the edges of the wound on the external surface of the leg, leaving a raw area about 12x6 cm. Another adhesive plaster dressing covering this area was unavoidably left for about 36 hours. On removing the plaster I was amazed to find the entire area, with the exception of two small spots, each about 1.5 x 1.5 cm., covered with a thin, whitish, film-like layer of epithelium. The soldier was then transferred to another ward, where I saw him about a week later and found the wound healed, except an area about 1x1 cm.

Another soldier, while riding a motorcycle at night without a light collided with a Ford automobile and sustained severe incised and lacerated wounds of the scalp, abdomen and right thigh. On the inner surface of the right thigh a rectangular flap of skin, about 10x2 cm. was turned down. This was sutured in place, but its upper portion sluft and the flap was then cut across diagonally, leaving a raw, triangular area whose longest sides were about 12 and 10 cm. On one side the area was bounded by a gutter whose depth was that of the entire thickness of the skin where the flap had been cut across; it was covered with clean, bright red granulations. In this condition the patient came under my care after transfer from another hospital. For about the first week under my direction the wound was dressed daily with plain, dry ,sterile gauze, or gauze wet with hot boric acid solution, but there was no perceptible tendency to heal. Zinc oxide adhesive plaster was then applied directly over the raw area, covering it completely. After repeating this two or three days in succession a white margin of new skin began to grow in over the red granulations. As this was not observed on the side bounded by the thick wall of skin where the flap was cut across, I decided to try skin grafts in this area. Under novocaine anesthesia about ten small deep grafts* were taken from a nearby area of skin of the same thigh and placed on the depressed portion of the granulating area. The entire wound, including the grafts was covered with zinc adhesive and not dressed again for forty-eight hours. At the end of this time all grafts had taken and the size of the raw area had greatly diminished. Similar dressings were repeated every two days and at the end of a week the grafts had spread and coalesced with one another and with skin growing in from the edges of the wound, so that an area of raw granulation tissues not exceeding 2x2 cm. remained. This was the state of the wound when I left the hospital to return home.

The same method was used in treating several others cases of burns and altho the total number was small the results were so gratifying as to demonstrate the advantage of the use of adhesive in this class of cases.

I recall one soldier who had a boil on the inner surface of the thigh just above the knee, followed by cellulitis and abscess. After drainage of the abscess a ganulating area about 1.5x1.5 cm. persisted and on account of this

*J. S. Davis, J. A. M. A., 1914, LXIII, p. 985.

the soldier had remained in the hospital about three months and it had been recommended that he be sent before the Disability Board for classification, when I decided to try the application of adhesive plaster directly over the area and this resulted in prompt healing and discharge of the soldier from the hospital. I have not used adhesive plaster in the manner just described for wounds acutely inflamed and actively suppurating, but have employed it only when the signs of acute inflammation have been controlled by the use of an antiseptic. I have found 1% suspension of dichloramin T in oil a most useful agent for this purpose, especially when used as first dressings for burns.

The method in detail, which I would wish you to try in treating denuded areas, such as ulcers, burns and raw areas resulting from accidental wounds or loss of skin by surgical operation, is as follows:

1. If the denuded area shows acute inflammation with abundant suppuration, it is first dressed daily with gauze dipped in dichloramin T suspended in oil, making a 1% mixture; as a rule this will promptly control an acute infection of a surface wound. Use of dichloramin T should not be continued long enough to produce irritation of the healthy skin around the wound.

II. When the wound is clean and healthy the use of adhesive plaster may be begun. This is placed immediately upon the wound, without the interposition of guaze or other material; care is taken that the part of the plaster to come into contact with the wound is not touched with the fingers nor anything else which may not be sterile. The wound is completely covered either with a single piece or overlapping strips of plaster. A light layer of cotton or gauze may be placed over the plaster to absorb any secretions which escape from beneath its edges and this may be kept in place by a few turns of roller bandage.

III. Dressings should be done daily. The plaster will be found adherent only to the healthy skin around the wound, the wound secretions preventing its adhesion to the raw tissues, so that its removal is not painful. After removing the plaster, the wound is cleansed by gently mopping with dry sterile gauze. No antiseptics are used. Should there be signs of infection and healing, therefore, not satisfactory, this, of course, would be an indication to discontinue the use of adhesive and substitute a different kind of treatment but I have thus far never had occasion to do this. I attribute the freedom from infection to the bactericidal properties of the serum of the secretions, due to its opsonins.

The accumulation of secretions beneath the plaster prevents drying and adhesion of the dressings and air is excluded; hence, the most common causes of pain are obviated.

The accumulated secretions form a bactericidal medium in which the proliferation of epithelium proceeds with great rapidty.

As a substitute for ambrine and other wax preparations for the treatment of burns zinc oxide adhesive plaster is quite satisfactory and very easy to apply.

Ihave used it only once as a dressing for skin grafts, but in that case every graft took and proliferated.

Altho no claim for originality in the method is made, I had never heard of its use in wounds such as I have described, except in the case of leg ulcer mentioned at the beginning of my paper. However, on reviewing the literature of the past nineteen years I find that employment of air-tight dressings of adhesive plaster for sterilization and healing of infected wounds was

advocated by Dr. M. B. Hutchins, of Atlanta in 1902.* Dr. Hutchins particularly stresses the usefulness of the method as a means of rapidly accomplishing disinfection of suppurating wounds and insists upon the necessity of applying the plaster in such manner that it shall remain air-tight. I have not as yet employed the plaster for this purpose, but my experience justifies me in heartily recommending it as a means of stimulating a rapid growth of epithelium over **clean** raw areas. I have never taken pains to make the dressing air-tight.

I shall, as soon as possible, try out the method as a means of disinfection of wounds. Dr. Hutchins states that it often converts a purulent into a serious wound discharge within two or three day and in attempting to explain this action mentions the following possible factors:

1. Possible ionic effect of zinc upon the tissues.
2. Production of edema, carrying out the principle of Bier's Staungs Hyperemie.
3. Exclusion of air, destroying aerobic bacteria.
4. Excess of serum, bringing a new army of antibodies (opsonins) into play.

I have not observed pronounced edema of the tissues in the cases in which I have used the plaster dressing and, as most common pyogenic bacteria are facultative anaerobes I am inclined to think too much stress is laid upon the importance of complete exclusion of air. To me it appears that the success of the method could be best explained by the bathing of the tissues in the antibody—containing serum.

Since writing the foregoing my attention has been called to an article by Emil G. Beck, in the Annals of Surgery for Mch., 1919, on Adhesive Plaster Method for the Regeneration of Skin over Granulating Wounds. In this article the good results of the method are attributed to the mechanicalaction of the plaster in holding down the granulation tissue of the raw area to a level with the extending margins of new skin

There need not be any anxiety as to introducing extraneous infection by using stock zinc oxide adhesive as it is bought on the spool. This is shown by the results of examination of adhesive plaster taken at random from a drug store stock, which were kindly made by Dr. F. A. Coward, State Bacteriologist, the plaster proving to be sterile.

DISCUSSION:

Dr. G. T. Tyler, Greenville: I have not had a large experience in the use of zinc adhesive plaster for such conditions, but when my attention was called to the subject, especially by the contribution of Dr. Beck in the Annals of Surgery which Dr. Peters has mentioned, I began to wonder if we had not tried a great many things and missed the real thing by using various ointments, scarlet red, ambrine, etc., and failing to use zinc oxide. I think we have missed the real problem in the healing of a granulating surface, namely, that it is mechanical. Dr. Beck had a very interesting diagram which showed the edge of the granulations above the edge of the epithelium. We have long known that skin will not grow uphill, and perhaps the adhesive plaster is for the purpose of removing the mechanical barrier to the advaneing epithelium and thus the skin will grow over the granulating surface. If there is a depression the skin will grow down hill very easily. The idea of having the wound sterile seems to me

*Hutchins, M. B., N. Y. Med. J., Feb. 22, 1902; Id., Oct. 5, 1907; J. Cut. Dis., 1913, XIII, P 470.

to be an excellent one, but Dr. Beck has described his method without waiting for the wound to become sterile. He applies the adhesive plaster and gauze and then the granulations are not rubbed off. By covering over the margin by adhesive plaster he chokes off the granulating area. It is a clean method and much more desirable than scarlet red if you use scarlet red every one knows it. Eleven years ago in the army it was my custom to use adhesive plaster on feet blistered by long marches. That was an instance of applying the plaster where there was no infection, and it was quite in keeping with what Dr. Peters has said in giving a scientific explanation. We have in zinc oxide adhesive plaster a mechanical device which has served us well.

Dr. H. W. Rice, Columbia: It seems to me this paper is a very valuable contribution, particularly for the general practitioner who has these conditions largely to deal with. Every one knows the difficulty involved and the time-consuming energy that is needed to effect anything like satisfactory results in these cases. One point has occurred to me that may possibly explain the quicker healing when zinc oxide is applied, and that is that the granulations are not rubbed off and destroyed as they are when dressings are used with ointments or ordinary dry dressings. It seems to me that the protection of the cells from destruction is a factor in the healing and also that the bath in the serum exercises a protective effect which has a great deal to do with the result.

Dr. S. O. Black, Spartanburg: My first experience with zinc oxide adhesive plaster with the epithelium was ulcerated was shortly after I came home from the army when I had a case that came from North Carolina. This patient had a large varicose ulcer larger than a ordinary tomato can top . I treated it with one thing and then changed to another without making much progress. Finally my father came home and I told him about the case and what I had been doing. He said use zinc oxide and carry it over from the healthy area of one side to the healthy area on the other side. We did that for a few days and the epithelial area began to proliferate and grew very rapidly and in three weeks the raw surface was entirely healed. This woman had had the Wasserman test and two or three course of mercury treatment, without any effect, but as soon as she had this treatment the ulcer healed very quickly.

Sometime later I had a little girl, 12 or 15 months old, who fell into the fire and burned her hands and arms almost to the shoulder and the face and forehead from one external auditory meatus to the opposite one. Five weeks after the burn was received she came under my observation. The burned area was large and there was very little good tissue. We decided that we could not use too many skin grafts. We applied some, but they did not do very well and in a few days granulations began to form and it seemed as if they would overgrow the grafts. We then took zinc oxide plaster and applied it all over the arms, scalp, sides of the face, and all the burned areas and after a few months the granulations were all gone and the child became perfectly well. She has perfectly good function of the arms.

The third case was that of a man who had the whole dorsum of his right foot crushed in a railroad accident, the car wheel passing over his foot. He had a violent infection and we took out a number of pieces of bone. In two weeks the foot became fairly clean and we applied zinc oxide and he got well in a remarkably short time.

A fourth patient had the fingers crushed and practically destroyed. I took zinc oxide and wrapped it about each finger, and this patient finally got the use of several fingers. The wound healed in a little over three weeks.

Dr Peters, in closing: I rather agree with Dr. Rice that probably the mechanical factor is not the only factor to explain the action of the plaster. I think the mechanical factor has something to do with the more rapid healing, but I thing the retention of serum of the epithelium and prevention of the adhesion of dressings which take off newly formed epithelium. Many are familiar with the strapping of ulcers, but with that method the areas were not entirely covered, but in the case I spoke of the area was covered completely.

AUTOINTOXICATION

By Edward H. Goodman, M. D., Philadelphia

THE subject of auto-intoxication is one upon which I have long desired to express myself, and when the invitation to address your society was received from your honored and honorable president, I could not resist the opportunity to inflict my views upon you. The question of auto-intoxication recurs periodically and seems almost like the ancient giant to arise with renewed vigor from every attempt to crush it to earth. You recall the celebrated exploit of Hercules who wrestling with Antaeus and finding that the giant's strength was invincible so long as he remained in contact with his mother, Earth,—

"Lifts proud Antaeus from his mother-plains
And with strong grasp the struggling giant strains;
Back falls his fainting head and clammy hair
Writhe his weak limbs, and flits his life in air."

It will take a mighty Hercules of the medical world to hold the monster auto-intoxication aloft to the sun of science until its strength fails.

The speaker assumes no Herculean role, his mental stature preventing this ambition being achieved, if it had e'er been conceived, his main task being a plea for truth, so that misunderstandings if any may be cleared away, and misconceptions if any may be altered.

Auto-intoxication has been defined by Combe as a poisoning caused by substances formed under the influence of the vital processes of the organism —a definition which he by no means defines, but rather delimits our conception, for are we to regard the toxemia of nephritis, diabetes, and pregnancy as auto intoxication, and the bacterial infections and food poisoning as of the same class? If so, are we dealing with a multitude of ills covered by the generic term, autointoxication, or must we define more strictly our conception?

As Taylor says, "We may define the term by what it does not contain as well as by what it does contain." A true autointoxication let us consider as does Taylor under five headings: (1) Poisoning from digestive fluids and secretions—increase or failure; (2) Normal products of digestion; (3) Abnormal products of digestion; (4) Substances normally formed from food by bacteria within the intestinal tract; (5) Abnormal products of bacterial disintegration.

First—Digestive secretions are poisonous as we all know, for pepsin and

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pancreatic juice are extremely toxic when injected into the circulation and it is assumed that normally these are distoxicated and rendered inert. May not failure to distoxicate result in autointoxication? Are we to consider hyper-chlorhydria which represents excess of digestive secretion, and obstructive jaundice which represents failure of digestive fluid, autointoxications?

Second—Some products of normal digestion—albumoses and peptones—are very toxic when administered parenterally, and although no proof has been offered is it not possible that they may be responsible for autointoxications?

Third—We know practically nothing of qualitative variations in the normal disintegration of protein, so very little can be said about the abnormal! In fat digestion beta oxybutyric and diacetic acids are formed. Is this an autointoxication?

Fourth—Regarding substances normally formed from food by bacteria it may be said that normally there are many saprophytes and some pathogenic bacteria, and fermentations and putrefactions are continuously going on. Do these cause autointoxication, or may there not be under certain favorable conditions a **greater** production of these normal products with a resultant intoxication? Normally, from carbohydrates are derived formic, acetic, butyric, proprionic, lactic, succinic and oxalic acids, but none with the exception of the last is toxic apart from its acidity. In fat fermentation the same acids are formed and they must be absorbed since the feces contain no trace of them. They are therefore presumably innocuous. During protein putrefaction, indol, skatol, phenol, and cresol are formed-derivatives of the benzol nucleus; derivatives of amino acids; mercaptan, hydrogen sulphide and other containing neutral sulphur All of these in the quantities formed are harmless. The question of possible toxicity of these substances will be referred to later.

Fifth—Abnormal products of protein putrefaction are called ptomaines—many of these are harmless, and excluding cases of ptomain poisoning by decomposed food there has been no authenticated case of gastrointestinal autaintoxication in which ptomains have ever been found.

To return to the generally accepted definition of our term, autointoxication, we should exclude from it all cases of exogenous intoxication, all of gout, diabetes, uremia, cholemia, hyperthyroidism, myxedema, tetany, acromegally, Addison's Disease, and all endocrin disturbances; all cases of bacterial invasion of whatever nature—local, intestinal or circulatory—whereby toxemia results by direct activity of the bacterium, or by absorption of its products of activity. We must limit ourselves, if we are to be considered as using the term in the customary sense, to the conception of gastrointestinal autointoxication as being the poisoning of the human organism by products of protein decomposition arising within the gastrointestinal tract. This, I believe, is what the majority of physicians have in mind when using the term, and it is the use of the term in this sense which provokes Adami to exclaim: "The word should and must be banished from the vocabulary of all self-respecting medical men."

In as much as autointoxication is inseparably linked with constipation in the thoughts of many, the constipation resulting from some interference with peristalsis, it may be profitable to recall the most recent researches on intestinal movements. With the introduction of the X-ray it was found that

the large intestine was ordinarily in a state of absolute rest but that three or four times within twenty-four hours there were vehement peristaltic movements lasting but a few seconds, which propelled the intestinal contents about one-third of the length of the large intestine (Holzknecht). Later Schwartz asserted that the normal intestine was never completely at rest but that there were continually going on, very slow peristaltic movements, for which view he claimed the ever changing haustral forms as proof.

Until the fascinating paper of Keith appeared in 1915 nothing further of note was contributed. Since Holyk-necht's time the roentgen ray has taught us that at certain points of the alimentary canal food is normally delayed, namely, (a) at the junction of the oesophagus; (b) at the junction of the stomach and duodenum; (c) at the duodeno-jejunal junction; (d) and at the lower end of the ileum. At these points, there seems to be a mechanism which regulates the passage of food downward. In the large intestine there are three points of normal delay:—(1) Near the commencement of the transverse colon leading to the filling of the cecum and ascending colon; (2) At the rectocolic junction leading to the filling of the pelvic colon; (3) Above the anal canal leading to accumulations in the rectum. Following his work on the nodal tissue of the heart, Keith inferred that similar tissue might be found in the intestine at the ileo-cecal injunction, because of the complex movements that arise there. Such a node was indeed found and was believed to be specialization of the myenteric plexus or Plexus of Auerbach, and attention then was directed to a study of this plexus. Contrary to the generally accepted view the myenteric plexus is not a mere aggregation of nerve cells and nerve fibres but it contains a third element—branching intermediate cells-like those found in the ileo-cecal collar, and because of this discovery Keith believed that the myenteric plexus represents a nodal and conducting system, reasoning from analogy that the intermediate branched cell is capable of assuming either a nerve element or muscle element as it does in the heart. Without detailing Keith's studies it may be said that he has found and described four rhythmical zones in the intestine-duodenal, jejuno-iliac, proximal colic, and a distal colic-and probably two more, a gastric and an oesophageal though for this belief there is imperfect evidence. According to Keith food is propelled along the alimentary tract through a series of zones or segments each furnished with its own pacemaker and rhythmical contractions similar to the mechanism in the heart. To have orderly -propulsion of the contents there must be close co-ordination between the various segments, for disturbance in any one upsets the rhythm in all the segments. The application of Keith's theory to stasis will be referred to shortly.

Alvarez' theory is that the myen-teric reflex is**not** the underlying cause of intestinal movements. (According to Bayliss and Starling's law, or Cannon's myenteric reflex, a stimulus applied to any part of the gut causes a contraction above and a relaxation below). This belief of Alvarez is based on the demonstration by Gaskell that there is no nervous are over which a true reflex can travel; furthermore the so-called reflex is hard to demonstrate, often absent, sometimes reversed, and always localized within 2-3 cm of the stimulated area. Alvarez has demonstrated that there is no relaxation before oncoming waves as is held in the Bayliss

and Starling's law, but on the contrary powerful contractions occur at some distance in advance, which of course has for its object the checking of intestinal movements, otherwise food entering the duodenum would rush unhindered to the anus. He believes the differences in rhythmicity, irritability and latent period, of the various intestinal segments are due to differences in rate of metabolism in the muscles of the different regions. (Details of this work can be found in the several papers of Alvarez' among "Collected Reprints" from the George Williams Hooper Foundation for Medical Research—Volume 111, 1917-1918). By this is meant that certain portions of the intestinal tract have contractions the rhythm of which varies according to the distance the intestinal segment is from the pylorus—for instance the duodenum contracts 15.3 times per minute, the jejumum 13.3, the upper ileum, 12.1, the lower ileum 10.5 and the colon 6.8. The duodenal segment is the first to begin beating well, and the tendency to rhythmic activity is graded from duodenum to ileum. The first few centimeters of the dodenum, corresponding to the duodenal cap in man do not beat well. An important observation is that segments from sickly animals beat poorly and become fatigued early, and at times the gradation of rhythm is entirely changed. In one case the segment contracted twice as rapidly as normal because of the presence of an inflamed area in the ileum.

This briefly represents the two most modern views of intestinal peristalsis, the one of Keith, in which the conception of the intestinal movements is based on a starting point, a node, and a pacemaker, whose functions it is to govern the beginning of movement and the speed with which it is carried on, and the other theory that of Alvarez which comprehends movement and rapidity of the same as an expression of mtabolic activity of different parts of the intestinal tract. Let us see how these theories may be applied to intestinal stasis or autointo ication.

Intestinal Stasis

As a result of any change in the normal peristalsis three conditions result (1) Anti-peristalsis; (2) Delayed peristalsis; (3) Accelerated peristalsis, or vomiting constipation and diarrhea, respectively. We have no concern ourselves at this moment with constipation, only. Constipation as generally believed means delay in the propulsion of contents through the extent of the large intestine.

Autointoxication and delayed intestinal evacuation are so hand in glove that one must consider them together. Lane uses the term "stasis" and "autointoxication" synonomously so it behooves us to know that stasis is, in Lane's terms "such an abnormal delay in the passage of the intestinal contents through a portion or portions of the gastrointestinal tract as results in the absorption into the circulation of a greater quantity of toxic poisonous materials than can be treated effectually by the organs whose functions it is to convert them into products as innocuous as possible to the tissues of the body." Lane, as you know, believes in intestinal delay on a mechanistic basis and describes three varieties (1) due to kinks; (2) diseased appendix; (3) static. All these varieties result from the tendency of the cecum to descend into the true pelvis due to defective feeding and through the erect postures, and not due to inflammation.

Opposed to this mechanistic theory is the recent one of Keith based on the conception of nodal rhythms in the intestine, of which mention has been

made earlier in this paper. He writes, "In passing along the alimentary tract food is propelled through a series of zones or segments each furnished with its own pace-maker and its own rhythmical contraction. In the heart we find two such zones—an auricular and a ventricular; in the normal heart the sino-auricular node is the faster pace-maker. But a block or imperfection in conduction may occur between the two zones of the heart, with the result that "back pressure"—a venous stasis—is produced. Now, seeing the similarity between the cardiac and alimentary motor mechanisms, we do not seem over presumptious if we suppose that irregularities may occur in the nodal and conducting system of the alimentary canal—irregularities of the same kind as are shown to occur in the heart. When such irregularities or blocks do occur we should expect to find them at the points where one rhythmical zone or area passes into the succeeding zone. That is exactly what we do find! We find a block where the oesophagus joins the stomach; we find another where the duodenal zone passes into jejunal and where the jejuno-iliac passes into the ileo-colic. We find a block may occur at any point of passage from a lower to a higher rhythm. At several of these junctional points, sphincters are situated and I do not deny that the mechanism of such sphincters may become disordered and cause stasis of the alimentary contents, but it will probably be found that a disturbance in the action of a sphincter is but part of the disturbance which affects the entire rhythmical segment to which it belongs.

"Further, it is clear that to obtain an orderly propulsion of the food along the whole length of the alimentary canal those various rhythmical zones must be closely co-ordinated in their action, and there is a growing body of evidence, both experimental and clinical, that points to a very close co-ordination by means of a complicated system of reflexes. Disturbances in any one segment upsets the rhythm in all the segments Bayliss and Starling observed that distension of the duodenum inhibited the action of the ileum: surgeons are familiar with the fact that a duodenal disturbance upsets the rhythm of the stomach. From the facts already mentioned it is easy to see that disturbance in the irritability and rhythm of the pace-maker of the cecum will be reflected to the lower ileum. One can understand, on the hypothesis I place before you, how stasis in the great bowel may be followed by ideal stasis, duodenal or gastric stasis, or how a disturbance of the conductivity or excitably of any of the rhythmical zones may ultimately give rise to stasis in all.

"I should do Sir W. Arbuthnot Lane, who has forced medical men the world over to investigate and attempt to relieve a condition which causes really as much suffering as even a great war, less than justice if I expected you to adopt the hypothesis of intestinal stasis I have placed before you in place of his simple mechanical explanation. I know he will not mind me describing his explanation of enterostasis as the "drag, band or kink" theory. My hypothesis you will find has a certain advantage over his. In the first place, I bring into the foreground the musculature of the alimentary tract, which is recognized by all as the sole propelling power in the intestinal wall. In his theory a defect in the musculature of the bowel takes a very minor part in the causation of stasis. Further, my theory is the more in harmony with the appearances observed by clinicians and pathologists, and because it rests on a

better basis of anatomical and physiological fact I believe it will ultimately win."

Now Alvarez' theory also deals with the musculature of the bowel but, denying the existence of a true reflex, emphasizes the metabolic activity of the muscle itself. He believes the intestinal tract normally has a descending gradient of metabolic activity which accounts for the propulsion of food onward from the stomach to the rectum. In his experimental work he found that if his animals were sickly the rhythmicity was disturbed and the gradient altered. He suggests that disturbance of metabolism in these segments accounts for changes in peristaltic movements and that stasis results from the sickliness of the individual and not sickliness from the stasis. He shows very conclusively that the gradient can be raised if the tone and rhythmicity at the oral end is raised, while a similar rise at the lower end would slow the current or reverse it. A rise in the middle of the tube would cause material to flow both ways from that point. (To those interested reasons for these assertions may be found in Alvarez' paper Journ. Am. Med. Ass. 1915 LXV. p. 388).

Here we have in brief, on the one hand, the apostle of mechanics, Lane, accounting for ill health on the basis of stasis, and on the other hand we have two vitalists Keith and Alvarez, urging the plea of stasis on the basis of ill-health. To the speaker the fascinating vitalistic theory especially that of Alvarez makes a stronger appeal than does the mechanistic hypothests, since it is founded on extraordinarily brilliant work and furthermore explains some of the clinical states which some may prefer to call autointoxication.

Results of Stasis

Granting that stasis does occur, and this we must admit otherwise our discussion were futile, what are its evil results? Most astounding of all statements are those of Lane in his several writings. I shall quote from him to some extent to show with what a dire disease we have to deal and how really simple is the treatment provided the large bowel can be short-circuited, disconnected or completely removed. "Large tubercular glandular masses in the abdomen disappear";—"Pigmentation of the skin especially in patients with dark hair, occasionally diagnosed as Addison's Disease by very competent physicians, disappears;—"Blue fingers and the cold clammy hand are replaced by the nice, warm pinkish one;"—"Again in the case of the kidney affected by so-called Bright's disease, which is merely a product of intestinal stasis cure follows surgery";—"Cancer of the breast or of the ducts of the liver or of the pancreas, all products of chronic intestinal stasis in the first instance, are cured";—"Imbecility," "epileptiform neuralgia of the Gasserian ganglion," "adenoma of the thyroid." The following are 17 symptoms and 9 diseases either directly or indirectly resulting from stais and auto-intoxication (Adami):

1.—Direct results of autointoxication (Lane)

1. Loss of fat.
2. Wasting of both voluuntary and involuntary muscles.
3. Alteration in the texture and color of the skin, with pigmentation and offensive perspiration.
4. Subnormal temperature, especially affecting the extremities. There is no abrupt line of separation between this condition and Raynaud's Disease of which it would appear to be a stage.
5. Mental conditions of apathy, stupidity or misery which may become exaggerated to a state of meloncholia, or

even apparent imbecility with suicidal tendencies. There may be neuralgic symptoms, neuritis, frequent headache, loss of control over the temper. These nervous states due to stasis are a much more frequent cause of serious crime than is generally imagined.

6. Rheumatic aches and pains in muscles, joint and skin.

7. Atrophy of the thyroid gland.

8. Either increased or lowered blood pressure.

9. Degenerative changes in the breasts, especially in the upper and outer zone of the left breast, predisposing to cancer. "In almost every case of cancer of the breast a previous history of chronic intestinal stasis can be demonstrated."

10. Prolapse of abdominal organs, partly because of wasted muscle fibres. Increased mobility of the kidneys, and prolapse and bends of the uterus.

11. Breathlessness on exertion, at times, of asthmatic type, due in some cases to a distension of the stomach and intestines.

12. Degeneration of the heart muscle with dilation of left heart and aorta and arteriosclerotic changes (atheroma) in the systemic arteries.

13. Renal changes which are roughly grouped under the term "Bright's Disease."

14. Early loss of hair color with falling out, more common in those with dark than with red hair.

15. Affections of the pancreas with chronic induration, inflammation and finally cancer. Pancreatic diabetes.

16. Infection of the biliary system, cholecystitis, cholelithiasis, cancer together with many acute and chronic diseases of the liver.

17. Degenerative diseases of the eye.

2. Indirect results of autointoxication

1. Infection of the gums and pyorrhea alveolaris.

2. Tuberculous infection other than that due to direct inoculation, as through the skin.

3. Rheumatoid arthritis. This like tuberculosis is declared not to develop, except in defective drainage of the gastro-intestinal tract.

4. Infection of the genito-urinary tract, producing nephritis, cystitis, pyelitis, endometritis, salpingitis, etc.

5. Thyroid disorders, such as diffuse enlargement, exophthalmic goitre, adenomatous tumors.

6. Still's disease.

7. Pustular eruption of the skin.

8. Infections of the large intestine; several varieties of mucous and ulcerative colitis.

9. Ulcerative endocarditis.

It would be futile to deny that Lane's views have been widely accepted, and it would be doing the medical fraternity at large a gross injustice not to assert that at present there are fewer men of great eminence and fewer of the great mass of medical practitioners who believe in stasis and autointoxication in the Lane sense. However, certain authors have plunged into the maelstrom, fascinated not so much by the struggle which must inevitably be theirs to emerge, but by the curious attraction which the unknown, uncertain and unseen have for many adventurous and heroic souls. Certain of these writers show no appreciation of the dangers of their plunge and certainly, judging from their efforts, no just and reasonable footing. One sees Lane through the disguise and only the blind would exclaim "The voice is Jacob's voice but the hands are the hands of Esau," so incomplete is the deception. I shall not attempt to give you a list of the ail-

ments according to the gospel of Lane by his ardent disciples, but so far afield are these enthusiasts carried that we see no writer ascribing certain symptoms of typhoid fever as due to stasis.

CAUSE OF THE SYMPTOMS OF TOXEMIA

First a word with Lane—in all of his papers he writes of the evil effects of poisoning but in none does he tell us what the poison is. Indican has long been the chosen one by many and curious and bewildering pictures are painted of its effects. Let me quote, with no names, from several authors, "Instead of **guessing** (the italics are mine) as to the diagnosis in those cases which come under our observation with indefinite symptoms, we should regularly test the 24 hour urine for indican and, after having made 20 or 30 of such tests we should, with due consideration of all other clinical symptoms, be able to make a diagnosis. "Under the "indefinite" gastrointestinal cases he puts gastric and duodenal ulcer and a few other equally easily recognizable diseases. Another author writes, "A satisfactory diagnosis of autointoxication is often difficult to make. When indican in abnormal quantities is found in the urine the diagnosis is easy." Another, "It is a simple matter to detect the putrefactive and fermentative changes in the large intestine-indican."

Now let us investigate the life history of indican or indoxyl sulphate of potassium. Indol is derived from tryptophan-alpha amino proprionic acid—a product of protein decomposition. This is deaminated the proprionic acid oxidized to acetic acid and the indol oxidized to indoxyl. The indol is carried by the portal blood to the liver and is there conjugated with sulphuric acid and exists as a potassium salt. This compound enters the blood in small quantities and is excreted by the kidneys, being known in the urine as indican. It is apparent therefore, that the presence of indican is an evidence of putrefaction of tryptophan and if the diet is poor in tryptophan, no matter how much decomposition takes place in the intestine, bacteria cannot form indican from the food. As Taylor says, supposing that the diet were a fixed one as far as trophan is concerned would it then be possible to use indican as an index of putrefaction? Only if all the indol were resorbed or if the degree of resorption were constant. There may be a strong resorption of a strong reaction or a faint resorption and a faint reaction, although the quantity of indol in both instances might be the same.

Now providing that indol is absorbed in large amounts what evidence have we that it is the cause of the symptoms known as autointoxication? No one can deny that indol is of itself toxic when injected into the circulation, but so are many foreign substances inadvisedly given, or a normal blood constituent like salt given in inordinate amounts. Indol does enter the portal circulation, as you know, but becomes inert after its linkage with sulphuric acid. In case there is too much indol formed too much indican will be found in the urine, but that does not prove that too much indol is in the circulating blood apart from the portal vein, rather it proves that the defenses in the liver are adequate. Would the detection of indol in the circulating blood prove anything? It would prove that too much indol was present but that is not proving that indol is the cause of the symptoms! There are other products of decomposition formed and poisoning by these can not be disregarded and as far as I know there have been no clinical investigations to show that indol, in autointoxication, is in excess in

the circulating blood. Does excessive sugar in the blood show that diabetes is caused by hyperglykemia? Finally, whether indol is or is not poisonous in the conditions known as autointoxication. Herter showed that indolis comparatively harmless even when given to men, in doses enormously greater than those ever encountered in health or disease.

No matter how seriously we may regard indicanuria, we are often puzzled by the fact that large amounts are found in individuals in perfect health, and small amounts in individuals with autointoxication symptoms. Also large amounts of indican are found in many individuals who are sick but who are, according to the usual standards of diagnosis not suffering with autointoxication. This fact was born in on me while in charge of Dr. John H. Musser's laboratory, where many hundreds of examinations were made on weighed and carefully estimated diets, these examinations including qualitative phenol, indican and aceton, quantitative estimations of total nitrogen, urea and ammonia nitrogen, fatty acids and total and conjugated sulphates. I shall have occasion, perhaps, again to quote this work as the paper progresses, but I can assure you diagnoses of autointoxication were not made on the basis of indican, for the findings were too inconstant to permit of this.

PHENOL has been thought by some to indicate autointoxication. The parent substances are tyrosin and phenylalanin. As is the case with indol, phenol is paired in the liver with sulphuric acid and rendered inert, a part being lost or burned in the process. Much of the production depends on diet, and much depends on the kind of bacteria—certain of the actively putrefying an-aerobic bacteria produce no indol or skatol, but much phenol; the colon bacillus is an active producer of indol. Hence unless we have a standard of what the normal flora of the intestine is we can not estimate abnormalities in this direction, no matter how certain we are that the diet is rich in tyrosin and phenylalanin.

THE CONJUGATE SULPHATES have been suggested as an index of autointoxication, and furthermore the relation the conjugate sulphates bear to the total sulphates. The -normal output is between 0.1 and 0.7 grm per day, and the ratio is 1:10. Phenol and indol are the principal aromatic bodies as far as autointoxication is concerned which are paired with sulphuric acid, and which are meant when speaking of ethereal sulphates or conjugated sulphates. Thus it might be supposed that the estimation of them would tell us everything about phenol and indol. Attention must be directed to four propositions enumerated by Taylor upon which this supposition nay belief has been based and I quote freely from Taylor who says that not one of the following propositions is sound:

1. The aromatic bodies conjugated with sulphuric acid are the only ones in the urine, hence the estimation of sulphates may be used to measure the total aromatic bodies.

2. The conjugated sulphates represent the quantity of aromatic bodies by bacteria in the intestine.

. The quantity of indoxyl is representative of the aromatic bodies of the intestine, and of the quantity of aromatic bodies formed in the intestine by bacteria.

4. The aromatic bodies of the urine are representative of the intensity of bacterial processes in the intestine. Taylor explains that.

1. There are many aromatic bodies in the urine which are not conjugated with sulphuric acid (hippuric acid, proprionic acid, and p-oxy-phenyl ace- Also there is some evidence for vola-

tile aromatic bodies and there are some bodies paired with d-glucuronic acid. Vegetarian urine contains many bodies, aromatic in nature, not linked with sulphuric acid.

2. The conjugated sulphates, unless all exogenous aromatic bodies are excluded, are not representative. Since all fruits and vegetables contain aromatic bodies, meat is the only diet suitable for a test diet, and this is something which has never been done by those who advocate the ethereal sulphate index. Also when dealing with a quantitative index it must be shown that none of these bodies is destroyed after resorption. This has not been demonstrated; on the contrary there is evidence to show that combustion in part does take place. It is not true even that resorption of all the aromatic bodies in the intestine occurs. Stools are seen with more aromatic bodies than the urine (loose and frequent stools and also constipated stools) showing incomplete resorption, and again the urine shows much and the stools very little—almost complete resorption. The mucosa may play a very important role since in starvation large amounts are found in the intestine and but moderate amounts in the urine.

With all the possible variations in the degree of resorption of aromatic bodies from the intestine (to say nothing of the difference in the amounts actually formed there) how can the quantity in the urine, event if completely and properly estimated, be taken as an index of the amount formed in the intestine? (Taylor)

3. The meaning of indoxyl or indican has been already discussed.

4. That the aromatic bodies of the urine are representative of the degree of bacterial changes in the intestine may be true but we must make allowances in all estimations of their importance for three factors—diet, bacterial flora, and resorption.

Recently other less well known substances have been studied. A bacillus isolated from pieces of ileum removed by Lane, acting upon histidiu produces beta-ium-azolylethylaviun, and this substance exerting a depressor action on blood pressure was thought by its discoverer, Mutch, to be responsible for the **low pressure** seen in autointoxication. However, it was later found by Mellanby that only **pure** culture of certain bacteria produced it, that with other organisms present it, it was broken down rapidly. It is not absorbed from the colon but is destroyed,—it causes diarrhea and vomiting and far from being responsible for constipation, it would be eliminated immediately by the bowel.

In as much as **high blood pressure** occurs in autointoxication as well as low pressure (Lane) it may be reasoned that the para-hydroxyl-phenyl-ethylamin of Dale and Dixon may be responsible for hypertension. Unfortunately these authors find that this as well as other pressor substances lose their effect when repeated given, whereas we know that hypertension usually progresses. Furthermore if these pressor drugs were responsible, purgation should cause a drop of the blood pressure to normal, which does not occur in cases of hypertension with or without the symptoms of so-called autointoxication.

It may be argued that the work of Whipple on intoxication in intestinal obstruction shows there are certain poisons, even lethal ones, formed in a certain type of stasis. The objection to this contention and the main one is that Whipple and his co-workers definitely state that the substance in proteose intoxication is not formed it the lumen of the bowel, but in the mucosa, in other words it is not absorbed from the lumen but from the mucosa.

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PLEA FOR RATIONAL UNDERSTANDING OF AUTOINTOXICATION

It must be apparent how little we know of so-called autointoxication, that is how little we know when we compare out knowledge with a well defined condition like tuberculosis let us say. The cause of autointoxication has never been found, the condition has never been reproduced experimentally, the symptoms in the hands of various authors vary, according to the specialty in which they happen to be interested, and the diagnosis is made on no sound basis, that is to say no demonstrable poison has been shown which can cause the disease and be recovered from the host. With those who say the diagnosis is easy when indican is found in the urine I am in disagreement! If indican is the lodstone that guides them uneerringly to this diagnosis their clinical bark will one day be wrecked on the hidden rocks of reason! It would be follhardy for anyone to say theere is no such thing as "intestinal toxemia," or "autointoxication:" there may be, but ' for one raise my humble voice in protest against the use of this term and the making of the diagnosis without evidence which at the present moment has not been offered, and which has not been universally accepted as unquestioned. It must be emphasized that not everyone who uses the term autointoxication understands what he wants others to understand, and which in the hands of many means so many varied things. Not every one who wears a yachting hat owns a yacht The term is a loose one and loosely used and as Hale White says, "If we are not careful we shall, before we know where we are, be invoking the aid of alimentary

toxemia in the same reprehensibly loose way as gout, uric acid diathesis, and congestion of the liver have been called into to explain various vague symptoms which we do not understand.

(Continued in July issue)

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